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<110> Tanzi, Rudolph E.
Kovacs, Dora
Saunders, Aleister J.

<120> Alpha-2-Macroglobulin Therapies and Drug Screening Methods for
Alzheimer's Disease

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<151> 1999-02-02
<150> 09/148,503
<151> 1998-09-04
<150> 60/093,297
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1090 1095 1100

Ile Thr Ile Ala Leu Leu Glu Ile Pro Leu Thr Val Thr His Pro Val
1105 1110 1115 1120

Val Arg Asn Ala Leu Phe Cys Leu Glu Ser Ala Trp Lys Thr Ala Gln
1125 1130 1135

Glu Gly Asp His Gly Ser His Val Tyr Thr Lys Ala Leu Leu Ala Tyr
1140 1145 1150

Ala Phe Ala Leu Ala Gly Asn Gln Asp Lys Arg Lys Glu Val Leu Lys
1155 1160 1165

Ser Leu Asn Glu Glu Ala Val Lys Lys Asp Asn Ser Val His Trp Glu
1170 1175 1180

Arg Pro Gln Lys Pro Lys Ala Pro Val Gly His Phe Tyr Glu Pro Gln
1185 1190 1195 1200

Ala Pro Ser Ala Glu Val Glu Met Thr Ser Tyr Val Leu Leu Ala Tyr
1205 1210 1215

Leu Thr Ala Gln Pro Ala Pro Thr Ser Glu Asp Leu Thr Ser Ala Thr
1220 1225 1230

Asn Ile Val Lys Trp Ile Thr Lys Gln Gln Asn Ala Gln Gly Gly Phe
1235 1240 1245

Ser Ser Thr Gln Asp Thr Val Val Ala Leu His Ala Leu Ser Lys Tyr
1250 1255 1260

Gly Ala Ala Thr Phe Thr Arg Thr Gly Lys Ala Ala Gln Val Thr Ile
1265 1270 1275 1280

Gln Ser Ser Gly Thr Phe Ser Ser Lys Phe Gln Val Asp Asn Asn Asn
1285 1290 1295

Arg Leu Leu Leu Gin Gln Val Ser Leu Pro Glu Leu Pro Gly Glu Tyr
1300 1305 1310

Ser Met Lys Val Thr Gly Glu Gly Cys Val Tyr Leu Gln Thr Ser Leu
1315 1320 1325

Lys Tyr Asn Ile Leu Pro Glu Lys Glu Glu Phe Pro Phe Ala Leu Gly
1330 1335 1340

Val Gln Thr Leu Pro Gln Thr Cys Asp Glu Pro Lys Ala His Thr Ser
1345 1350 1355 1360

Phe Gln Ile Ser Leu Ser Val Ser Tyr Thr Gly Ser Arg Ser Ala Ser
1365 1370 1375

Asn Met Ala Ile Val Asp Val Lys Met Val Ser Gly Phe Ile Pro Leu
1380 1385 1390

Lys Pro Thr Val Lys Met Leu Glu Arg Ser Asn His Val Ser Arg Thr
1395 1400 1405

Glu Val Ser Ser Asn His Val Leu Ile Tyr Leu Asp Lys Val Ser Asn
1410 1415 1420

Gln Thr Leu Ser Leu Phe Phe Thr Val Leu Gln Asp Val Pro Val Arg
1425 1430 1435 1440

Asp Leu Lys Pro Ala Ile Val Lys Val Tyr Asp Tyr Tyr Glu Thr Asp

1445

1450

1455

Glu Phe Ala Ile Ala Glu Tyr Asn Ala Pro Cys Ser Lys Asp Leu Gly

1460

1465

1470

Asn Ala

<210> 3

<211> 750

<212> DNA

<213> Homo sapiens

<220>

<221> CDS

<222> (1)..(750)

<223> A β /LRP Binding Domain

<400> 3

tcg gag gac ctg acc tct gca acc aac atc gtg aag tgg atc acg aag 48
Ser Glu Asp Leu Thr Ser Ala Thr Asn Ile Val Lys Trp Ile Thr Lys
1 5 10 15

cag cag aat gcc cag ggc ggt ttc tcc tcc acc cag gac aca gtg gtg 96
Gln Gln Asn Ala Gln Gly Phe Ser Ser Thr Gln Asp Thr Val Val
20 25 30

gct ctc cat gct ctg tcc aaa tat gga gcc gcc aca ttt acc agg act 144
Ala Leu His Ala Leu Ser Lys Tyr Gly Ala Ala Thr Phe Thr Arg Thr
35 40 45

ggg aag gct gca cag gtg act atc cag tct tca ggg aca ttt tcc agc 192
Gly Lys Ala Ala Gln Val Thr Ile Gln Ser Ser Gly Thr Phe Ser Ser
50 55 60

aaa ttc caa gtg gac aac aac aat cgc ctg tta ctg cag cag gtc tca 240
Lys Phe Gln Val Asp Asn Asn Asn Arg Leu Leu Leu Gln Gln Val Ser
65 70 75 80

ttg cca gag ctg cct ggg gaa tac agc atg aaa gtg aca gga gaa gga 288
Leu Pro Glu Leu Pro Gly Glu Tyr Ser Met Lys Val Thr Gly Glu Gly

85

90

95

tgt gtc tac ctc cag acc tcc ttg aaa tac aat att ctc cca gaa aag 336
Cys Val Tyr Leu Gln Thr Ser Leu Lys Tyr Asn Ile Leu Pro Glu Lys

100

105

110

gaa gag ttc ccc ttt gct tta gga gtg cag act ctg cct caa act tgt 384
Glu Glu Phe Pro Phe Ala Leu Gly Val Gln Thr Leu Pro Gln Thr Cys
115 120 125

gat gaa ccc aaa gcc cac acc agc ttc caa atc tcc cta agt gtc agt 432
Asp Glu Pro Lys Ala His Thr Ser Phe Gln Ile Ser Leu Ser Val Ser
130 135 140

tac aca ggg agc cgc tct gcc tcc aac atg gcg atc gtt gat gtg aag 480
Tyr Thr Gly Ser Arg Ser Ala Ser Asn Met Ala Ile Val Asp Val Lys
145 150 155 160

atg gtc tct ggc ttc att ccc ctg aag cca aca gtg aaa atg ctt gaa 528
Met Val Ser Gly Phe Ile Pro Leu Lys Pro Thr Val Lys Met Leu Glu
165 170 175

aga tct aac cat gtg agc cgg aca gaa gtc agc agc aac cat gtc ttg 576
Arg Ser Asn His Val Ser Arg Thr Glu Val Ser Ser Asn His Val Leu
180 185 190

att tac ctt gat aag gtg tca aat cag aca ctg agc ttg ttc ttc acg 624
Ile Tyr Leu Asp Lys Val Ser Asn Gln Thr Leu Ser Leu Phe Phe Thr
195 200 205

gtt ctg caa gat gtc cca gta aga gat ctc aaa cca gcc ata gtg aaa 672
Val Leu Gln Asp Val Pro Val Arg Asp Leu Lys Pro Ala Ile Val Lys
210 215 220

gtc tat gat tac tac gag acg gat gag ttt gca atc gct gag tac aat 720
Val Tyr Asp Tyr Tyr Glu Thr Asp Glu Phe Ala Ile Ala Glu Tyr Asn
225 230 235 240

gct cct tgc agc aaa gat ctt gga aat gct 750
Ala Pro Cys Ser Lys Asp Leu Gly Asn Ala
245 250

<210> 4

<211> 250

<212> PRT

<213> Homo sapiens

<400> 4

Ser Glu Asp Leu Thr Ser Ala Thr Asn Ile Val Lys Trp Ile Thr Lys

1 5 10 15

Gln Gln Asn Ala Gln Gly Gly Phe Ser Ser Thr Gln Asp Thr Val Val

20 25 30

Ala Leu His Ala Leu Ser Lys Tyr Gly Ala Ala Thr Phe Thr Arg Thr

35 40 45

Gly Lys Ala Ala Gln Val Thr Ile Gln Ser Ser Gly Thr Phe Ser Ser

50 55 60

Lys Phe Gln Val Asp Asn Asn Asn Arg Leu Leu Leu Gln Gln Val Ser

65 70 75 80

Leu Pro Glu Leu Pro Gly Glu Tyr Ser Met Lys Val Thr Gly Glu Gly

85 90 95

Cys Val Tyr Leu Gln Thr Ser Leu Lys Tyr Asn Ile Leu Pro Glu Lys

100 105 110

Glu Glu Phe Pro Phe Ala Leu Gly Val Gln Thr Leu Pro Gln Thr Cys

115 120 125

Asp Glu Pro Lys Ala His Thr Ser Phe Gln Ile Ser Leu Ser Val Ser

130 135 140

Tyr Thr Gly Ser Arg Ser Ala Ser Asn Met Ala Ile Val Asp Val Lys

145 150 155 160

Met Val Ser Gly Phe Ile Pro Leu Lys Pro Thr Val Lys Met Leu Glu

165 170 175

Arg Ser Asn His Val Ser Arg Thr Glu Val Ser Ser Asn His Val Leu
180 185 190

Ile Tyr Leu Asp Lys Val Ser Asn Gln Thr Leu Ser Leu Phe Phe Thr
195 200 205

Val Leu Gln Asp Val Pro Val Arg Asp Leu Lys Pro Ala Ile Val Lys
210 215 220

Val Tyr Asp Tyr Tyr Glu Thr Asp Glu Phe Ala Ile Ala Glu Tyr Asn
225 230 235 240

Ala Pro Cys Ser Lys Asp Leu Gly Asn Ala
245 250

<210> 5

<211> 333

<212> DNA

<213> Homo sapiens

<220>

<221> CDS

<222> (1)..(333)

<223> A_β Binding Domain

<400> 5 48
tcg gag gac ctg acc tct gca acc aac atc gtg aag tgg atc acg aag
Ser Glu Asp Leu Thr Ser Ala Thr Asn Ile Val Lys Trp Ile Thr Lys
1 5 10 15

cag cag aat gcc cag ggc ggt ttc tcc tcc acc cag gac aca gtg gtg 96
Gln Gln Asn Ala Gln Gly Gly Phe Ser Ser Thr Gln Asp Thr Val Val
20 25 30

gct ctc cat gct ctg tcc aaa tat gga gcc gcc aca ttt acc agg act 144
Ala Leu His Ala Leu Ser Lys Tyr Gly Ala Ala Thr Phe Thr Arg Thr
35 40 45

ggg aag gct gca cag gtg act atc cag tct tca ggg aca ttt tcc agc 192
Gly Lys Ala Ala Gln Val Thr Ile Gln Ser Ser Gly Thr Phe Ser Ser

50 55 60

aaa ttc caa gtg gac aac aac aat cgc ctg tta ctg cag cag gtc tca 240
Lys Phe Gln Val Asp Asn Asn Arg Leu Leu Gln Gln Val Ser
65 70 75 80

ttg cca gag ctg cct ggg gaa tac agc atg aaa gtg aca gga gaa gga 288
Leu Pro Glu Leu Pro Gly Glu Tyr Ser Met Lys Val Thr Gly Glu Gly
85 90 95

tgt gtc tac ctc cag acc tcc ttg aaa tac aat att ctc cca gaa 333
Cys Val Tyr Leu Gln Thr Ser Leu Lys Tyr Asn Ile Leu Pro Glu
100 105 110

<210> 6
<211> 111
<212> PRT
<213> Homo sapiens

<400> 6
Ser Glu Asp Leu Thr Ser Ala Thr Asn Ile Val Lys Trp Ile Thr Lys
1 5 10 15

Gln Gln Asn Ala Gln Gly Gly Phe Ser Ser Thr Gln Asp Thr Val Val
20 25 30

Ala Leu His Ala Leu Ser Lys Tyr Gly Ala Ala Thr Phe Thr Arg Thr
35 40 45

Gly Lys Ala Ala Gln Val Thr Ile Gln Ser Ser Gly Thr Phe Ser Ser
50 55 60

Lys Phe Gln Val Asp Asn Asn Asn Arg Leu Leu Gln Gln Val Ser
65 70 75 80

Leu Pro Glu Leu Pro Gly Glu Tyr Ser Met Lys Val Thr Gly Glu Gly
85 90 95

Cys Val Tyr Leu Gln Thr Ser Leu Lys Tyr Asn Ile Leu Pro Glu
100 105 110

<210> 7
<211> 417
<212> DNA
<213> Homo sapiens

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<220>
<221> CDS
<222> (1)..(417)
<223> LRP Binding Domain
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<400> 7
aag gaa gag ttc ccc ttt gct tta gga gtg cag act ctg cct caa act 48
Lys Glu Glu Phe Pro Phe Ala Leu Gly Val Gln Thr Leu Pro Gln Thr
1 5 10 15

```

tgt gat gaa ccc aaa gcc cac acc agc ttc caa atc tcc cta agt gtc 96
Cys Asp Glu Pro Lys Ala His Thr Ser Phe Gln Ile Ser Leu Ser Val
                           20                      25                      30

```

agt tac aca ggg agc cgc tct gcc tcc aac atg gcg atc gtt gat gtg 144
Ser Tyr Thr Gly Ser Arg Ser Ala Ser Asn Met Ala Ile Val Asp Val
35 40 45

aag atg gtc tct ggc ttc att ccc ctg aag cca aca gtg aaa atg ctt 192
Lys Met Val Ser Gly Phe Ile Pro Leu Lys Pro Thr Val Lys Met Leu
50 55 60

```

gaa aga tct aac cat gtg agc cgg aca gaa gtc agc agc aac cat gtc 240
Glu Arg Ser Asn His Val Ser Arg Thr Glu Val Ser Ser Asn His Val
   65           70           75           80

```

ttg att tac ctt gat aag gtg tca aat cag aca ctg agc ttg ttc ttc 288
Leu Ile Tyr Leu Asp Lys Val Ser Asn Gln Thr Leu Ser Leu Phe Phe
85 90 95

acg gtt ctg caa gat gtc cca gta aga gat ctc aaa cca gcc ata gtg 336
Thr Val Leu Gln Asp Val Pro Val Arg Asp Leu Lys Pro Ala Ile Val
100 105 110

aaa gtc tat gat tac tac gag acg gag ttt gca atc gct gag tac 384
Lys Val Tyr Asp Tyr Tyr Glu Thr Asp Glu Phe Ala Ile Ala Glu Tyr
115 120 125

aat gct cct tgc agc aaa gat ctt gga aat gct 417
Asn Ala Pro Cys Ser Lys Asp Leu Gly Asn Ala
130 135

<210> 8
<211> 139
<212> PRT
<213> Homo sapiens

<400> 8
Lys Glu Glu Phe Pro Phe Ala Leu Gly Val Gln Thr Leu Pro Gln Thr
1 5 10 15

Cys Asp Glu Pro Lys Ala His Thr Ser Phe Gln Ile Ser Leu Ser Val
20 25 30

Ser Tyr Thr Gly Ser Arg Ser Ala Ser Asn Met Ala Ile Val Asp Val
35 40 45

Lys Met Val Ser Gly Phe Ile Pro Leu Lys Pro Thr Val Lys Met Leu
50 55 60

Glu Arg Ser Asn His Val Ser Arg Thr Glu Val Ser Ser Asn His Val
65 70 75 80

Leu Ile Tyr Leu Asp Lys Val Ser Asn Gln Thr Leu Ser Leu Phe Phe
85 90 95

Thr Val Leu Gln Asp Val Pro Val Arg Asp Leu Lys Pro Ala Ile Val
100 105 110

Lys Val Tyr Asp Tyr Tyr Glu Thr Asp Glu Phe Ala Ile Ala Glu Tyr
115 120 125

Asn Ala Pro Cys Ser Lys Asp Leu Gly Asn Ala
130 135

<210> 9
<211> 81
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (1)..(81)
<223> Consensus LRP Binding Domain

<400> 9
ttc att ccc ctg aag cca aca gtg aaa atg ctt gaa aga tct aac cat 48
Phe Ile Pro Leu Lys Pro Thr Val Lys Met Leu Glu Arg Ser Asn His
1 5 10 15

gtg agc cg^g aca gaa gtc agc agc aac cat gtc 81
Val Ser Arg Thr Glu Val Ser Ser Asn His Val
20 25

<210> 10
<211> 27
<212> PRT
<213> Homo sapiens

<400> 10
Phe Ile Pro Leu Lys Pro Thr Val Lys Met Leu Glu Arg Ser Asn His
1 5 10 15

Val Ser Arg Thr Glu Val Ser Ser Asn His Val
20 25

<210> 11
<211> 33
<212> DNA
<213> Homo sapiens

<220>

<221> CDS
<222> (1)..(33)
<223> A β Fibril Inhibitor

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<400> 11  
cgc gat ctg cca ttc ttc cca gtc cca att gat  
Arg Asp Leu Pro Phe Phe Pro Val Pro Ile Asp  
1 5 10
```

<210> 12
<211> 11
<212> PRT
<213> Homo sapiens

<400> 12
Arg Asp Leu Pro Phe Phe Pro Val Pro Ile Asp
1 5 10

<210> 13
<211> 114
<212> DNA
<213> *Homo sapiens*

```
<220>
<221> CDS
<222> (1)..(114)
<223> A8 Fibril Inhibitor
```

<400> 13
cgc gat ctg cca ttc ttc cca gtc cca att gat ttc att ccc ctg aag 48
Arg Asp Leu Pro Phe Phe Pro Val Pro Ile Asp Phe Ile Pro Leu Lys
1 5 10 15

cca aca gtg aaa atg ctt gaa aga tct aac cat gtg agc cg^g aca gaa 96
Pro Thr Val Lys Met Leu Glu Arg Ser Asn His Val Ser Arg Thr Glu
20 25 30

gtc agc agc aac cat gtc 114
Val Ser Ser Asn His Val

<210> 14
<211> 38
<212> PRT
<213> Homo sapiens

<400> 14
Arg Asp Leu Pro Phe Phe Pro Val Pro Ile Asp Phe Ile Pro Leu Lys
1 5 10 15

Pro Thr Val Lys Met Leu Glu Arg Ser Asn His Val Ser Arg Thr Glu
20 25 30

Val Ser Ser Asn His Val
35

<210> 15
<211> 27
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (1)..(27)

<400> 15
cgc gat ctg cca ttc ttc cca gtc gat 27
Arg Asp Leu Pro Phe Phe Pro Val Asp
1 5

<210> 16
<211> 9
<212> PRT
<213> Homo sapiens

<400> 16
Arg Asp Leu Pro Phe Phe Pro Val Asp

1 5

<210> 17
<211> 21
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (1)..(21)

<400> 17
ctg cca ttc ttc cca gtc gat
Leu Pro Phe Phe Pro Val Asp
1 5

21

<210> 18
<211> 7
<212> PRT
<213> Homo sapiens

<400> 18
Leu Pro Phe Phe Pro Val Asp
1 5

<210> 19
<211> 18
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (1)..(18)

<400> 19
ctg cca ttc ttc gtc gat
Leu Pro Phe Phe Val Asp
1 5

18

<210> 20
<211> 6
<212> PRT
<213> Homo sapiens

<400> 20
Leu Pro Phe Phe Val Asp
1 5

<210> 21
<211> 15
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (1)..(15)

<400> 21
ctg cca ttc ttc gat 15
Leu Pro Phe Phe Asp
1 5

<210> 22
<211> 5
<212> PRT
<213> Homo sapiens

<400> 22
Leu Pro Phe Phe Asp
1 5

<210> 23
<211> 12
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (1)..(12)

<400> 23
ctg cca ttc ttc
Leu Pro Phe Phe
1

12

<210> 24
<211> 4
<212> PRT
<213> Homo sapiens

<400> 24
Leu Pro Phe Phe
1

<210> 25
<211> 9
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (1)..(9)

<400> 25
cca ttc ttc
Pro Phe Phe
1

9

<210> 26
<211> 3
<212> PRT
<213> Homo sapiens

<400> 26

Pro Phe Phe
1

<210> 27

<211> 50

<212> DNA

<213> Homo sapiens

<220>

<223> Noncoding-antisense DNA

<400> 27

catgcaccag gcgtgcatgg cctcttccca ttacatctga ctctgagtga

50